DOCUMENT RESUME

ED 459 876 JC 020 068

AUTHOR Head, Ronald B.
TITLE Distance Learning at Piedmont Virginia Community College.
INSTITUTION Piedmont Virginia Community Coll., Charlottesville, VA. Office of Institutional Research and Planning.
REPORT NO RR-9-2001
PUB DATE 2001-11-00
NOTE 25p.
PUB TYPE Reports - Research (143)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; Access to Education; Community Colleges; Computer Mediated Communication; Delivery Systems; *Distance Education; Grade Point Average; *Nontraditional Education; *Online Courses; *Telecourses; Two Year Colleges; Withdrawal (Education)
IDENTIFIERS *Piedmont Virginia Community College

ABSTRACT

This research paper analyzes the distance learning program at Piedmont Virginia Community College (PVCC) for the 2000-2001 school year, during which PVCC offered 34 distance learning classes. Findings indicate that: (1) 25 of the classes were Web-based (asynchronous) and 9 were compressed video (synchronous); (2) nearly 3% of all classes at PVCC during the year were distance learning classes; (3) an average of 12 students was enrolled in each class; (4) 318 students, or 4% of all students, were enrolled in at least 1 distance learning class--this percentage was the lowest in the Virginia Community College System (VCCS); (5) 17% of students enrolled in distance learning were in compressed video classes, 83% in Web-based classes, and 0.6% in both; (6) although the percentage of distance learning students needing remedial classes was similar to that of regular students, distance learning students were much more likely to need remedial math than remedial English or other remedial coursework; (7) the cumulative GPA of distance learning students (2.980) was similar to that of regular students (2.985); and (8) the withdrawal rate for Web-based classes (25%) was much higher than for compressed video (9%) and regular (11%) classes, suggesting that many students enrolling in online courses were unprepared for the special demands of Web-based learning. (NB)

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Research Report No. 9-2001
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Piedmont Virginia Community College
Charlottesville, Virginia

Ronald B. Head
Executive Director of Planning and Information Technology
Piedmont Virginia Community College

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Distance Learning
at Piedmont Virginia Community College

By

Ronald B. Head
Executive Director of Planning and Information Technology
Piedmont Virginia Community College

Office of Institutional Research
Piedmont Virginia Community College
Charlottesville, Virginia 22902
Research Report No. 9-2001

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Introduction

Distance learning, as a term in higher education, refers to classes delivered in such a manner as to overcome barriers of time or place (or both). Such classes have been around for many years in one form or another (correspondence courses, public television classes, VCR-taped courses, etc.), but recently, interactive television courses and especially courses offered on the Internet have become very popular and promise to revolutionize delivery of teaching and learning.

Distance learning courses generally can be divided into two categories: *synchronous* and *asynchronous*. Synchronous courses are those that eliminate the barrier of place, but not that of time. Examples include compressed video and public television classes, which can be offered at multiple locations but are scheduled at only one time. Asynchronous classes are those that eliminate both barriers of time and place. Examples include web-based and correspondence courses that can be taken by students in different locations and at different times.

Many institutions of higher education, especially community colleges, have embraced distance learning and use new delivery methods not only to increase enrollment but also to provide access to students who otherwise could not attend college. The Virginia Community College System (VCCS), of which Piedmont Virginia Community College (PVCC) is a member, has been in the forefront of distance learning since the mid-1990's. In 2000-01, 15.5% of all students attending the 23 VCCS schools were enrolled in at least one distance learning class. Percentages

ranged from a high of 37.6% of all students at New River Community College to a low of 4.4% at PVCC. During the same time, 7.1% of all FTES (full-time equivalent students) produced by the VCCS were generated from distance learning classes. Percentages ranged from a high of 25.7% at Rappahannock Community College to a low of 1.8% at PVCC.

As can be seen from these figures, PVCC has lagged behind the rest of its sister schools in the VCCS in distance learning, and is only now beginning to offer a variety of compressed video and web-based classes. This study is an examination of distance learning at PVCC last year. What classes were offered, characteristics of distance learning students, and the academic performance of distance learning students are some of the topics explored.

Distance Learning Classes

Prior to 2000-2001, few distance learning classes were taught at PVCC. In 1998-99, for instance, only 9 courses were taught, and in 1999-2000, the number rose to only 13. In 2000-01, however, the number nearly tripled, as 34 distance learning classes were taught. Twenty-five of these were web-based, online courses (asynchronous) and 9 were compressed video (synchronous). Compressed video and web-based instruction were the only two methods of distance learning used by PVCC in 2000-01.

As can be seen in Table 1, 13 classes were taught in the fall and 21 in the spring. Nearly 3% of all classes at PVCC during the year were distance learning classes.

Table 1: Distance Learning Classes by Delivery Method

	Synchronous (compressed video, print-based, etc.)		Asynchronous (web-based)		All distance learning classes	
	No.	Pct. of all classes	No.	Pct. of all classes	No.	Pct. of all classes
Fall 2000	5	0.8%	8	1.3%	13	2.2%
Spring 2001	4	0.7%	17	2.8%	21	3.5%
Total	9	0.8%	25	2.1%	34	2.8%

A list of all distance classes taught in 2000-01 by class title, term, and delivery method is shown in Tables 2 and 3. As can be seen, disciplines taught using compressed video classes were French, Human Services, and Latin, and disciplines taught using the Internet were Accounting, Administrative Systems Technology, Biology, English, Health, Information Systems Technology, and Nursing.

Table 4 presents distance learning classes by discipline and delivery method. For each discipline, the number of classes, students, and FTES are shown.

Table 2: Compressed Video Classes

Fall 2001
FRE 101 (French 101--Beginning French I)
FRE 201 (French 201--Intermediate French I)
HMS 190 (Coop--Managing Senior Adult Activities
HMS 276 (Administrative Activities Department in Long-Term Care)
LAT 101 (Latin I)
Spring 2002
FRE 102 (French 102--Beginning French II)
FRE 202 (French 202--Intermediate French II)
HMS 138 (Activities for Geriatric Clinets)
HMS 190 (Coop--Managing Senior Adult Activities

Table 3: Web-Based Classes

Fall 2001
BIO 101 (General Biology I)
BIO 101 (General Biology I)—Lab
BIO 102 (General Biology II)
BIO 102 (General Biology II)—Lab
ENG 111 (College Composition I)
HLT 143 (Medical Terminology I)
IST 114 (Fundamentals of Computer Information Systems)
NUR 254 (Nursing Dimensions)
Spring 2002
ACC 211 (Principles of Accounting I)
ACC 212 (Principles of Accounting II)
AST 137 (Records Management)
BIO 101 (General Biology I)
BIO 101 (General Biology I)—Lab
BIO 102 (General Biology II)
BIO 102 (General Biology II)—Lab
ENG 111 (College Composition I)
ENG 112 (College Composition II)
ENG 116 (Writing for Business)
ENG 230 (Mysteries in Film and Literature)
ENG 255 (Major Writers in World Literature)
HLT 143 (Medical Terminology I) **[2 sections]**
IST 114 (Fundamentals of Computer Information Systems) **[2 sections]**
NUR 254 (Nursing Dimensions)

Table 4: Distance Learning Classes by Discipline

Synchronous (compressed video, print-based, etc.)			
Discipline	*Classes*	*Students*	*FTES*
French	4	45	5
Human Services	4	22	1
Latin	1	7	1
Subtotal	***9***	***74***	***7***
Asynchronous (web-based)			
Discipline	*Classes*	*Students*	*FTES*
Accounting	2	32	3
Admin. Support Technology	1	9	1
Biology	8	54	4
English	6	98	10
Health	3	42	4
Information Systems Technology	3	76	8
Nursing	2	24	1
Subtotal	***25***	***335***	***31***

An average of 12 students was enrolled in each distance learning class. The average number of students (13.4) in web-based courses was slightly higher than the number enrolled in compressed video courses (9). As can be seen in Table 5, the total number of duplicated students for compressed video classes was 81, and the total number for web-based classes was 335. The total number of FTES produced by all distance learning classes was 38, or 1.8% of all annual FTES. Compressed video classes generated 8 annualized FTES, and web-based classes generated 30 (see Table 6).

Table 5: Enrollments in Distance Learning Classes (2000-01)

	Synchronous (compressed video, print-based, etc.)		Asynchronous (web-based)		All distance learning classes	
	No.	Pct. of all Enrollments	No.	Pct. of all Enrollments	No.	Pct. of all Enrollments
Fall 2000	52	0.5%	88	0.8%	140	1.3%
Spring 2001	29	0.3%	247	2.5%	276	2.8%
Total	81	0.4%	335	1.6%	416	2.0%

Table 6: FTES produced by Distance Learning Classes (2000-01)

	Synchronous (compressed video, print-based, etc.)		Asynchronous (web-based)		All distance learning classes	
	No.	Pct. of all FTES	No.	Pct. of all FTES	No.	Pct. of all FTES
Fall 2000	10	0.5%	15	0.8%	25	1.3%
Spring 2001	6	0.3%	45	2.5%	51	2.8%
Total	8	0.4%	30	1.4%	38	1.8%

The majority of all distance learning classes in 2000-01 was offered through the Division of Continuing Education. Continuing Education faculty taught 6 of the 9 compressed video classes and 17 of the 25 web-based classes. The three remaining compressed video classes were offered through the Division of Humanities and Social

Sciences. The Division of Business Technologies offered five web-based classes, and the Division of Science and Technology offered three.

With respect to other class characteristics, two-thirds of the compressed video classes were taught at night. In contrast, only one-third of regular, classroom-based courses were taught at night. Two of the nine compressed video classes (22.2%), and 4 of the 25 web-based classes (16%), were completely filled. The percentage of regular classes completely filled was 20.5%. Finally, as was the case with regular classes, adjunct faculty taught the majority of distance learning classes. Seven of the 9 compressed video classes (77.8%), and 16 of the 25 web-based classes (64%) were taught by adjuncts. Adjunct faculty taught 61.7% of regular classes.

Distance Learning Students

Prior to 2000-01, as can be seen in Figure 1, only a small number of distance learning students was enrolled at PVCC. In 1996-97, 16 distance learning students were enrolled; in 1997-98, the figure increased by 231% to 53; then in 1998-99 and 1999-2000, the figure remained relatively stable at 57 and 48, respectively; finally, in 2000-01, the figure increased by 563% to 318. As defined in this study, a distance learning student is any student enrolled in at least one distance learning class.

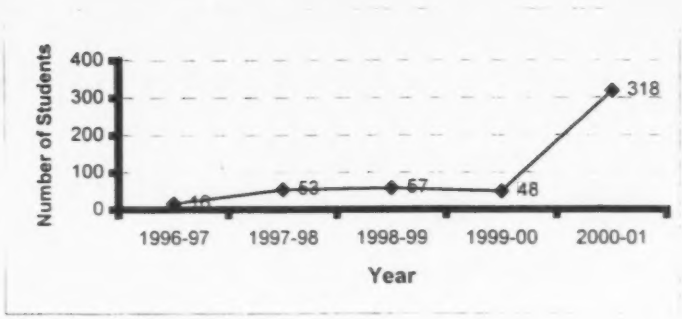


Figure 1: PVCC Distance Learning Students

The 318 distance learning students comprised 4.4% of all unduplicated students who attended PVCC during the year. Examining only the distance learning classes taken by students, 53 students (16.7%) were enrolled only in compressed video classes, 263 (82.7%) only in web-based classes, and 2 (0.6%) in both compressed video and web-based classes. Forty-three students (13.5%) took *only* distance learning classes, and 275 (86.5%) took both distance learning and regular classes. A total of 113 distance learning students was enrolled in the fall semester, and 235 in the spring semester. Of these, 83 (26.1%) enrolled only during the fall, 205 (64.5%) only during the spring, and 30 (9.4%) during both semesters.

As can be seen in Tables 7, 8, and 9, distance learning students were slightly younger than regular students and more likely to be female and White. Seventy-one percent of distance learning students were women, as compared to only 59.2% of regular students; 86.1% of distance learning students were White, as compared to only 80.4% of regular students; and the average (or mean) age of distance learning students was 30, as compared to a mean age of 32 for students not enrolled in distance learning courses. As was true for regular students, the majority (77.3%) of non-White distance

learning students was African-American. In terms of age, the youngest distance learning student was 17, the oldest was 60, the median age was 26, and the mode age was 19.

Table 7: Distance Learning Students by Sex

	Distance Learning Students		Regular Students	
	No.	Pct.	No.	Pct.
Male	92	28.9%	2,795	40.7%
Female	226	71.1%	4,072	59.3%
TOTAL	318	100.0%	6,867	100.0%

Table 8: Distance Learning Students by Race

	Distance Learning Students		Regular Students	
	No.	Pct.	No.	Pct.
White	274	86.2%	5,524	80.4%
Black	33	10.4%	918	13.4%
American Indian	1	0.3%	18	0.3%
Oriental	3	0.9%	213	3.1%
Hispanic	3	0.9%	86	1.3%
Other	4	1.3%	108	1.6%
TOTAL	318	100.0%	6,867	100.0%

Table 9: Distance Learning Students by Age

	Distance Learning Students		Regular Students	
	No.	Pct.	No.	Pct.
Under 18	2	0.6%	271	3.9%
18-21	81	25.5%	1,800	26.2%
22-24	49	15.4%	737	10.7%
25-34	101	31.8%	1,569	22.8%
35-44	52	16.4%	1,208	17.6%
45-59	32	10.1%	1,111	16.2%
60 & Over	1	0.3%	171	2.5%
TOTAL	318	100.0%	6,867	100.0%

A common assumption among many lay people and educators is that distance learning students, especially those enrolled in web-based courses, do not live within commuting distance of campus. As can be seen in Table 10, for PVCC at least, this

was not the case in 2000-01. In fact, the opposite was true. While 85.7% of regular students resided within the college service region, the percentage of distance learning students living within the service region was two percentage points higher (87.7%). Of the distance learning students residing outside the service region, 8.2% were residents of Virginia, 2.9% were residents of other states within the United States, and 1.2% were foreign residents.

Table 10: Distance Learning Students by Residence

	Distance Learning Students		Regular Students	
	No.	Pct.	No.	Pct.
Albemarle	103	32.4%	2,246	32.7%
Buckingham	9	2.8%	98	1.4%
Fluvanna	31	9.7%	654	9.5%
Greene	23	7.2%	434	6.3%
Louisa	20	6.3%	372	5.4%
Nelson	17	5.3%	351	5.1%
Charlottesville	76	23.9%	1,732	25.2%
Service Region Subtotal	*279*	*87.7%*	*5,887*	*85.7%*
In-State	26	8.2%	758	11.0%
Out-of-State	13	4.1%	222	3.2%
TOTAL	318	100.0%	6,867	100.0%

Another common assumption about distance learning is that a large number of distance learning students study part-time. Because of hectic work and family situations, the notion goes, distance learning students have time only for limited study at times and places convenient to them. Again, this was not true for distance learning students at PVCC in 2000-01. As can be seen in Table 11, the percentage of distance learning students enrolled full-time at the college (26.7%) was almost twice as high as the percentage of students not enrolled in distance learning classes (14%). While only slightly over one-fourth of all distance learning students was classified as full-time,

these full-time students produced more than one-half of all FTES (53.3%) generated by distance learning students. Twenty-nine percent (28.9%) of all distance learning students carried a load between 3 and 6 credit hours; 28.9% a load between 6 and 9 credit hours; 15.4% a load between 9 and 12 credit hours; 19.8% a load between 12 and 15 credit hours; 5.3% a load between 15 and 18 credit hours; and 1.5% a load of 18 or more credit hours.

Table 11: Distance Learning Students by Load

	Distance Learning Students		Regular Students	
	No.	Pct.	No.	Pct.
Full-Time	85	26.7%	958	14.0%
Part-Time	233	73.3%	5,909	86.0%
TOTAL	318	100.0%	6,867	100.0%

As noted in the introduction, one reason community colleges like PVCC promote distance learning classes is to overcome barriers of time and distance and attract new students who might otherwise be unable to attend classes. In this respect, one might expect a higher percentage of distance learning students to be new. This was not the case at PVCC in 2000-01. Three-quarter of all distance learning students had previously attended classes at PVCC. In contrast, less than two-thirds of all regular students were new to PVCC. Of the new distance learning students, 22 (6.9%) were first-time students and 49 (15.4%) were transfer students.

Table 12: Distance Learning Students by Enrollment

	Distance Learning Students		Regular Students	
	No.	Pct.	No.	Pct.
1st-Time	22	6.9%	1,361	19.8%
Transfer	49	15.4%	1,290	18.8%
Returning	247	77.7%	4,216	61.4%
TOTAL	318	100.0%	6,867	100.0%

Distance learning students were more likely than regular students to be enrolled in curricula of study leading toward associate degrees or certificates. As can be seen in Table 13, nearly one-half of all distance learning students was enrolled in college transfer curricula and nearly one-quarter in occupational/technical curricula. In all, 70% of distance learning students were curricular students, as compared to only 43% of regular students.

Table 13: Distance Learning Students by Program

	Distance Learning Students		Regular Students	
	No.	Pct.	No.	Pct.
College Transfer	152	47.8%	1,948	28.4%
Occupational/ Technical	72	22.6%	984	14.3%
Unclassified	94	29.6%	3,935	57.3%
TOTAL	318	100.0%	6,867	100.0%

Of the distance learning students enrolled in college transfer curricula, 47 (30.9%) were in curricula leading toward an Associate of Arts degree, and 105 (69.1%) were in curricula leading toward as Associate of Science degree. Of the distance learning students enrolled in occupational/technical curricula, 67 (93.1%) were in programs leading toward an Associate of Applied Science degree and 5 (6.9%) were in certificate programs. Twenty (21.3%) of the non-curricular students were classified as taking classes for "personal satisfaction," 16 (17%) as "upgrading employment

skills," 8 (8.5%) as "transient students," 7 (7.4%) as "non-degree transfer students," 6 (6.4%) each as either "career exploration" or "high school student," 3 (3.2%) as "developing job skills," and the others (29.8%) were waiting to be admitted to a curriculum.

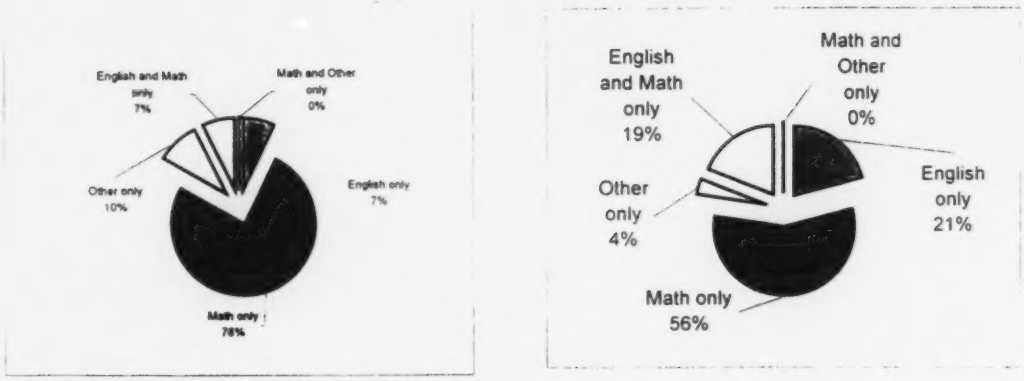
Only ten (3.1%) distance learning students were recent high school graduates (that is, students who had graduated from high school in 2000). In contrast, the percentage of recent high school graduates was more than twice as high among regular students (7.8%). Two of the recent high school graduates enrolled in distance learning classes had graduated from Monticello High School, two from Nelson County High School, one each from Buckingham County High School, Charlottesville High School, William Monroe High School, and Western Albemarle High school, and the remaining two from high schools outside the service region. In examining high schools attended by all distance learning students (and not just recent high school graduates), 216 students (68%) had graduated from (or were enrolled in) Virginia high schools, 83 (26.1%) from high schools in other states, and 19 (5.9%) had received the GED.

The percentage of distance learning students enrolled in one or more developmental courses was similar to that of regular students. As can be seen in Table 14, 13.2% of all distance learning students, and 12.1% of all regular students, were taking developmental courses. However, distance learning students were much more likely to require remedial math than remedial English or other remedial course work.

Table 14: Distance Learning Students by Developmental Status

	Distance Learning Students		Regular Students	
	No.	Pct.	No.	Pct.
English only	3	0.9%	174	2.5%
Math only	32	10.1%	470	6.8%
Other only	4	1.3%	31	0.5%
English and Math only	3	0.9%	155	2.3%
Math and Other only	-	0.0%	1	0.0%
SUBTOTAL (Developmental students)	*42*	*13.2%*	*831*	*12.1%*
Non-Developmental students	276	86.8%	6,036	87.9%
TOTAL	318	100.0%	6,867	100.0%

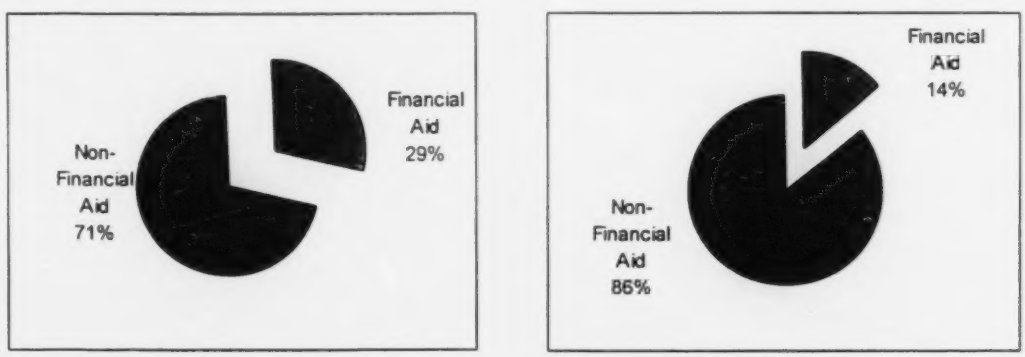
As can be seen in Figure 2, over three-quarters of the distance learning students enrolled in developmental classes were taking only developmental math. Of the remainder, 7.1% were enrolled in both developmental math and developmental English; 9.5% were enrolled in developmental Chemistry (shown as "Other" in Figure 2), and 7.1% were enrolled in only developmental English. In contrast, 56.6% of regular students was enrolled in only developmental math; 20.9% in only developmental English; 18.7% in both developmental math and developmental English; 3.7% in developmental Chemistry; and 0.1% in developmental math and developmental Chemistry.



Distance Learning Students Regular Students

Figure 2: Developmental Status of Distance Learning Students

Twice as many distance learning students received financial aid as did regular students. As can be seen in Figure 3, 28.9% of all distance learning students received some form of financial assistance as compared to 13.9% of all students not enrolled in distance learning classes.



Distance Learning Students Regular Students

Figure 3: Financial Aid Status of Distance Learning Students

One caution in examining distance learning student characteristics in 2000-01 is that classes were offered in only 11 academic disciplines. In contrast, traditional, classroom-based instruction was offered in 59 disciplines. As any educator knows,

different disciplines attract different types of students. Students studying nursing, for instance, are more likely to be female, while those studying engineering are more likely to be male. In this respect, the student characteristics in this study may have more to do with the discipline taught than the delivery method. It will be interesting to reexamine student characteristics several years from now when distance learning expands to include more academic disciplines.

Distance Learning Academic Performance

Most distance learning students perform quite well academically as measured by grades and grade point average. Less than 20% of all grades (A-F) earned in distance learning courses were below B, and the cumulative GPA (grade point average) of distance learning students was 2.980, almost the same as that of regular students (2.985).

As can be seen in Table 15, over one-half of all grades in distance learning classes were A's, and one-quarter were B's. Very few C's and D's were awarded, and 10% of the grades were F's. The grade distribution in asynchronous classes was similar to that in synchronous classes, though more A's were awarded, and more F's as well. When considering only A-F grades, classes awarding 60% or more A's were NUR 254 (83.3%), HMS 276 (80%), IST 114 (73.4%), HMS 190 (73.3%), ENG 255 and FRE 102 (62.5%), ENG 112 (61.1%), and HMS 138 (60%). Classes awarding 20% or more F's were ACC 212 (50%), ACC 211 (42.9%), ENG 230 (30%), BIO 101 (28.6%), BIO 102 and ENG 255 (25%), and HMS 138 (20%).

Table 15: Distance Learning Grades (A-F)

Grade	Synchronous (compressed video, print-based, etc.)		Asynchronous (web-based)		All distance learning classes	
	No.	Pct. of all classes	No.	Pct. of all classes	No.	Pct. of all classes
A	47	52.8%	132	58.9%	179	57.2%
B	29	32.6%	50	22.3%	79	25.2%
C	6	6.7%	12	5.4%	18	5.8%
D	2	2.2%	3	1.3%	5	1.6%
F	5	5.6%	27	12.1%	32	10.2%
Total	89	100.0%	224	100.0%	313	100.0%

The grade distribution of distance learning classes differed slightly from that of traditional classes, as is shown in Figure 4. While only 17.6% of all grades in distance learning classes were below B, 26.9% of all grades in regular classes were below B. Proportionally fewer A's were awarded in regular classes (46.3% as compared to 57.2%); far more C's (15.3% as compared to 5.8%) and D's (4.5% as compared to 1.6%); and fewer F's (7.1% as compared to 10.2%).

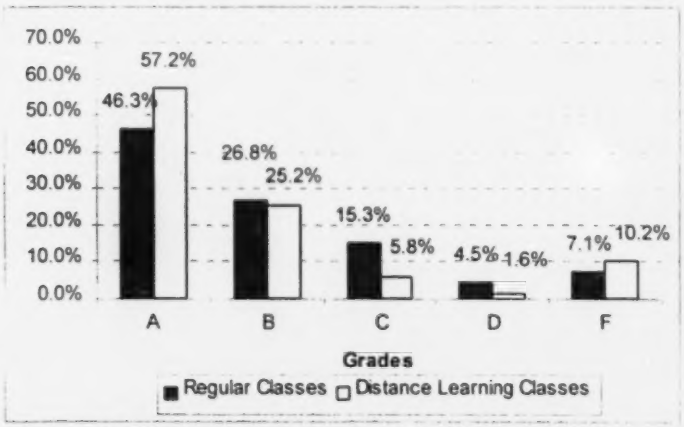


Figure 4: Grade Distribution of Distance Learning Students

While the percentage of class withdrawals was approximately the same for compressed video classes as for regular classes (9.1% and 10.7%, respectively), the

percentage was much higher for web-based classes (25.3%). This suggests there may be some truth to the common assumption that many students enroll in online courses without realizing how much work and time is involved. Or the high attrition rate could be the result of the high interaction between web-based instructors and students (students not doing well are encouraged by instructors to withdraw from class or are administratively withdrawn by the instructors). Web-based classes with high withdrawal rates included ACC 211 (45% of all grades), ACC 212 (41.6%), ENG 111 (36.1%), BIO 101 (34.2%), and AST 137 (33.3%).

With respect to other types of grades, 18 Incomplete (I) and 6 Repeat (R) grades were given in web-based classes. The 6 R grades were all given in ACC 211, and the I grades were given in ACC 211 (2), ACC 212 (6), BIO 102 (1), ENG 111 (1), ENG 230 (3), ENG 255 (3), and HLT 143 (1).

As mentioned at the beginning of this section, the cumulative GPA of distance learning students in Fall 2001 was 2.980. The cumulative GPA of women (3.042) was higher than that of men (2.819); of Whites (3.020) than of minority students (2.655 for African-Americans and 2.956 for other minorities); of transfer students (3.126) than of either first-time (2.698) or returning students (2.981); and of students enrolled in occupational/technical curricula (3.041) than of students enrolled in college transfer curricula (2.941) or of non-curricular students (2.984). The cumulative GPA of full-time (2.988) and part-time (2.976) students was comparable.

Conclusions

This study has examined what types of distance learning courses are offered at PVCC, enrollment in these courses, characteristics of students taking distance learning classes, and how well distance learning students perform academically. In 2000-01, distance learning classes were offered in only a small number of disciplines—Accounting, Administrative Support Technology, Biology, English, French, Health, Human Services, Information Systems Technology, Latin, and Nursing—and accounted for only a small fraction of the college's total enrollment. Distance learning students were similar to their counterparts in traditional classrooms in many respects, though surprisingly, they were more likely to be full-time degree-seeking students living within the service region who had already attended PVCC. Only a small number was enrolled only in distance learning classes, and academically, distance learning students performed comparably to other students in terms of grades and grade point averages.

PVCC did make considerable progress in its distance learning in 2000-01. More classes were offered and the number of students enrolling in these classes more than quintupled. The increase in web-based classes was especially impressive.

Despite this progress, the college enrolled the lowest percentage of distance learning students in the VCCS. Last year's gains, however, represent only one stage in the evolution of distance learning at PVCC. Already, this fall, 27 classes in 7 disciplines are being taught, producing 71 FTES. These FTES represent 3.7% of all fall semester FTES. In terms of headcount, 273 different students—or 6.5% of all enrolled students—are taking at least one distance learning class at PVCC. While such

percentage figures are not likely to position PVCC among VCCS leaders in distance education, they do indicate solid progress is occurring.

Because distance learning is so new at PVCC, additional research should be conducted. Areas for further research might include comparisons of teaching strategies and grades in online and traditional classes; successful teaching methodologies in distance learning; satisfaction of students with distance learning classes; performance-based evaluation in distance learning and traditional courses; reasons for attrition in web-based courses; the availability of support services for online students; and transfer patterns of online students to four-year colleges and universities.